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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/616,411

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John Guthrie

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EXAMINER

DAYE, CHELCIE L

ART UNIT

PAPER NUMBER

2161

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/616,411	<b>Applicant(s)</b> GUTHRIE, JOHN	
	<b>Examiner</b> Chelcie Daye	<b>Art Unit</b> 2161	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 July 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/12/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This action is issued in response to applicant's amendment filed July 12, 2006.
2. Claims 1-21 are presented. Claim 21 added and no claims cancelled.
3. Claims 1-21 are pending.
4. Applicant's arguments filed July 12, 2006, have been fully considered but they are not persuasive.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Newly added claim 21 states, "replacing said node and said ancestor nodes of the node that have not yet been replaced with one or more new nodes *only if said indication is absent*". It is unclear to the examiner why the node and the ancestor nodes are replaced only if said indication is absent. Examiner is unsure if and why, that is the only reason that the nodes can be replaced and if so, where within the specification is

that limitation supported. As a result, examiner will give the broadest reasonable interpretation to the claim language, in order to further prosecution.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 1,2,5,11,16 and 17, are rejected under 35 U.S.C. 102(b) as being anticipated by Hitz (US Patent No. 5,819,292).**

Regarding Claim 1, Hitz discloses a method in a computer system for creating a file system snapshot, the data of the file system being organized hierarchically via nodes, the method comprising:

copying a root node of the file system to a new node that points to the same child nodes of the root node (column 18, lines 19-23, Hitz), the new node represents a root node of the snapshot (column 18, lines 24-26, Hitz); and

when a node of the file system is modified<sup>1</sup> (columns 6 and 7, lines 67 and 1, respectively, Hitz; wherein “dirty” indicates modify),

identifying and replacing ancestor<sup>2</sup> nodes of the node that have not yet been replaced with a new node (Fig.19; column 19, lines 55-67, Hitz);

replacing the node with a new node that points to the same child nodes of the replaced node (Fig.18C; column 19, lines 23-26, Hitz); and effecting the modification on the new node (column 20, lines 1-6, Hitz).

Regarding Claim 2, Hitz discloses a method wherein when multiple snapshots occur (Fig. 22, items 2110A, 2110B, and 2110C; column 18, lines 8-10, Hitz), the ancestor nodes of the node to be modified that are replaced (Fig.19; column 19, lines 63-67, Hitz) are those ancestor nodes that have not yet been replaced during the current snapshot (column 20, lines 38-43, Hitz).

Regarding Claim 5, Hitz discloses a method wherein when the snapshot is accessed via the root node of the snapshot (column 11, lines 20-27, Hitz).

Regarding Claim 11, Hitz discloses a method wherein the file system is a Unix-based file system (column 23, lines 20-21, Hitz).

Regarding Claims 16 and 17, Hitz discloses a method wherein when a block of a file is modified (column 18, lines 4-7, Hitz), the new node associated with that file is set to reference a block that contains the modified block (column

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<sup>1</sup> Examiner notes – The term “dirty” throughout the “Hitz” reference represents modify (columns 6-7, lines 67 and 1, respectively, and column 11, lines 57-59 and column 12, lines 41-43).

<sup>2</sup> As shown on Fig.19, blocks 1918 and 1926 are above and point to block 1910, therefore making blocks 1918 and 1926 ancestors of block 1910. Also, pointers 1924 and 1928 for referencing new node 1910 represent ancestor nodes 1918 and 1926. The pointers are index entries, which identifies space.

11, lines 57-59, Hitz), rather than the block that contains the unmodified data (column 19, lines 31-35, Hitz).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**10. Claims 3,4,6-10,12,13,and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hitz (US Patent No. 5,819,292) as applied to claims 1,2,5,11,16, and 17 above, and further in view of Eshel (US Patent No. 6,959,310).**

Regarding Claim 3, Hitz discloses a method to determine whether the ancestor node has been replaced during the current snapshot (column 20, lines 38-43, Hitz). Hitz further discloses a method wherein each new node has a snapshot identifier that identifies the snapshot during which it replaced a node and including checking the snapshot identifier of an ancestor node. Although, Hitz does disclose the snapshot having an identifier, which is essentially needed within a file system in order to distinguish which snapshots are new/replaced and which are not. However, Hitz does not go into great detail about the identifier of the snapshot. Therefore, to further expedite the examination, Eshel in more

detail, discloses wherein each new node has a snapshot identifier that identifies the snapshot during which it replaced a node (column 25, lines 11-18, Eshel) and including checking the snapshot identifier of an ancestor node (column 19, lines 25-33, Eshel). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Eshel's teaching into the Hitz system. A skilled artisan would have been motivated to combine in order to optimize the retrieval process by allowing the system to easily recognize the snapshot and data, which were being searched. As a result, this enables the system to more efficiently utilize the memory within the processing equipment to, reduce the amount of time to produce the snapshot.

Regarding Claim 4, the combination of Hitz in view of Eshel, discloses a method wherein when a node is not to be part of a snapshot (column 22, lines 11-14, Hitz), associating an indication with that node (column 22, lines 37-39, Hitz) so that node will not be replaced when it or any descendent node is modified (column 22, lines 62-67, Hitz).

Regarding Claim 6, the combination of Hitz in view of Eshel, discloses a method wherein each new node has an identifier that is different from the identifier of the node it replaced (column 27, lines 12-18, Eshel).

Regarding Claims 7 and 9, the combination of Hitz in view of Eshel, discloses a method including associating the identifier of the replacing node with the replaced node so that (column 11, lines 29-37, Eshel), when a request to access a node identified by the identifier of the replaced node is received, that association is used to access the replacing node (column 13, lines 7-13, Eshel).

Regarding Claim 8, the combination of Hitz in view of Eshel, discloses a method wherein the associating includes storing the identifier of the new node in the replaced node (column 13, lines 59-63, Eshel).

Regarding Claim 10, the combination of Hitz in view of Eshel, discloses a method wherein each node has a reference count that includes a count of the snapshots through which the node is accessible (column 25, lines 35-44, Eshel).

Regarding Claim 12, the combination of Hitz in view of Eshel, discloses a method wherein a snapshot identifier (column 25, lines 16-18, Eshel) is stored within each node (Fig.8B, item 802, Eshel).

Regarding Claim 13, the combination of Hitz in view of Eshel, discloses a method wherein a snapshot identifier (column 25, lines 16-18, Eshel) is stored as an attribute of each node (column 13, lines 20-25, Eshel).



Regarding Claim 18, the combination of Hitz in view of Eshel, discloses a method including reference counting each snapshot that refers to a block (column 25, lines 35-44, Eshel) so that the block can be removed when there are no more references to the block (column 26, lines 6-9, Eshel).

Regarding Claim 19, the combination of Hitz in view of Eshel, discloses a method including when the reference counting is performed using a table external to the block (column 5, lines 53-56, Hitz).

Regarding Claim 20, the combination of Hitz in view of Eshel, discloses a method wherein the table includes for each block a bit for each snapshot that indicates whether the block is referenced by the snapshot (column 18, lines 27-30, Hitz).

Regarding Claim 21, the combination of Hitz in view of Eshel, disclose a method in a computer system for creating a file system snapshot, the data of the file system being organized hierarchically via nodes, the method comprising:

associating with one or more current file system nodes an indication (column 22, lines 37-39, Hitz) that said nodes are not to be part of said snapshot (column 22, lines 11-14, Hitz);

copying a root node of the file system to a new node that points to the same child nodes of the root node (column 18, lines 19-23, Hitz), wherein the

new node represents a root node of the snapshot (column 18, lines 24-26, Hitz);

and

when a node of the file system is modified<sup>3</sup> (columns 6 & 7, lines 67 and 1, respectively, Hitz),

checking the node and ancestor nodes of the node for said indication  
(column 14, lines 60-67, Eshel);

replacing said node and said ancestor nodes of the node that have not yet  
been replaced with one or more new nodes only if said indication is absent  
(column 19, lines 23-67, Hitz)<sup>4</sup>.

**11. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hitz (US Patent No. 5,819,292) in view of Sekido (US Patent No. 6,311,193).**

Regarding Claim 14, Hitz discloses all of the claimed subject matter.

However, Hitz does not explicitly disclose a method wherein a virtual identifier is stored within a node. On the other hand, Sekido discloses a method wherein a virtual identifier is stored within a node (Fig.18; column 9, lines 33-44, Sekido). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Sekido's teachings into the Hitz system. One would have been motivated to do so in order to ensure that the information being copied was

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<sup>3</sup> Examiner notes – The term “dirty” throughout the “Hitz” reference represents modify (columns 6-7, lines 67 and 1, respectively, and column 11, lines 57-59 and column 12, lines 41-43).

<sup>4</sup> Examiner Notes – If there is not indication to let the system know that the nodes are not to be part of said snapshot, then the nodes are by default replaced.

correct and relevant to what was needed. The virtual identifier is an implicit or abstract representation of information and is therefore not physically on the system. As a result, this increases much needed storage space within the system.

Regarding Claim 15, the combination of Hitz in view of Sekido, discloses a method wherein a virtual identifier is stored as an attribute of a node (column 14, lines 17-21, Sekido).

### ***Response to Arguments***

*Applicant argues, Hitz does not disclose the newly amended limitation of "identifying and replacing ancestor nodes of a node being modified". Also, applicant argues, Hitz does not "identify ancestor nodes or replace them as logical units as claimed".*

Examiner respectfully disagrees. To begin, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "replace them as logical units") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). However, in response to Hitz failing to disclose newly amended limitation of "identifying and replacing ancestor

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nodes of a node being identified”, Hitz discloses at column 19, lines 55-67, wherein the pointer 1924 of block 1918 references new block 1910, and pointer 1928 of block 1926 references new block 1910 as well, wherein the pointers are identifiers of the ancestor nodes to allow the system to know those blocks must also be written to disk in a new location. As stated by the online dictionary ([www.dictionary.com](http://www.dictionary.com)), the definition of a pointer is an identifier giving the location in storage of something of interest. Therefore, Hitz does disclose identifying and replacing ancestor nodes.

*Applicant argues, “no reference of record teaches associating an indication with an active file system node that the node is to be isolated from a subsequent snapshot”.*

Examiner respectfully disagrees. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “the node is to be isolated from a subsequent snapshot”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). However, as stated in the action above, Hitz discloses at column 22, lines 11-14 and 37-39, wherein BIT0, is an indication that if the active bit is cleared before any snapshot bits are set, the block is not present in any snapshot. To further clarify, Hitz discloses at column 20, lines 54-59, wherein within an individual snapshot at any given time, a file system can be deleted. When BIT0, which references the active file, is cleared (indicating the block has

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been deleted from the active file), the block cannot be reused. Thereby demonstrating an indication with an active file system node that the node is not to be part of a snapshot.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


***Points of Contact***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chelcie Daye whose telephone number is 571-272-3891. The examiner can normally be reached on M-F, 7:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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